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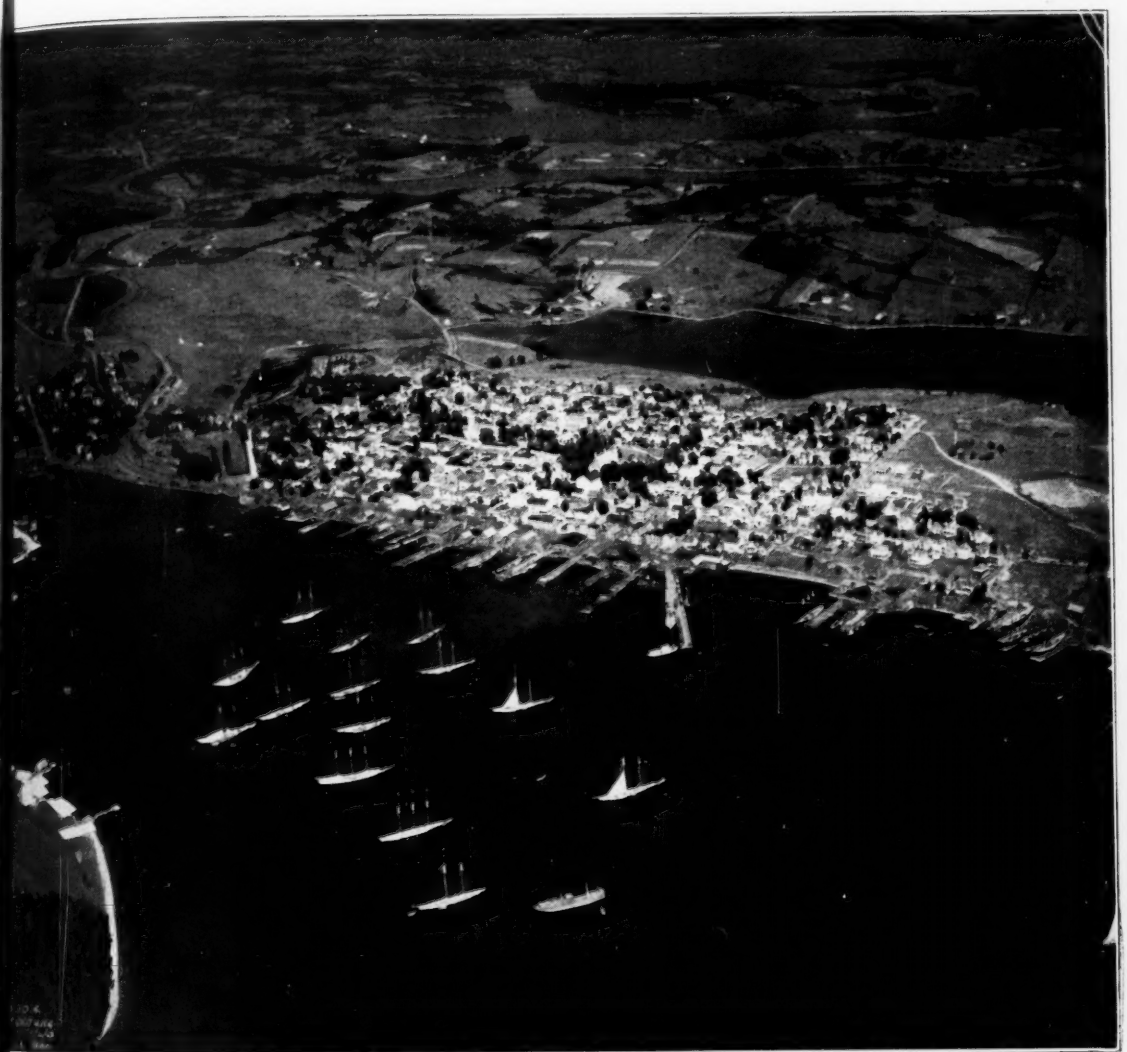

Courtesy Royal Canadian Air Force

A view of the famous fishing port of Lunenburg, Nova Scotia

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THE JOURNAL OF GEOGRAPHY

CONTENTS FOR APRIL, 1929

The Iron and Steel Industry of the United States. By Richard Hartshorne 133

This is the seventh article in our series dealing with great industries. Dr. Hartshorne is an assistant professor of geography in the University of Minnesota, and author of the following studies in manufactural geography: Location Factors in the Iron and Steel Industry, *Economic Geography*, July, 1928; The Economic Geography of Plant Location, in National Association of Real Estate Boards, *Annals of Real Estate Practice*, 1926, Vol. VI; and Location as a Factor in Geography, *Annals of the Association of American Geographers*, June, 1927.

The Selection of Subject Matter for Geography in the Elementary School. By Frank M. McMurry 153

Dr. McMurry is Emeritus Professor of Education, Teachers College, Columbia University. His many contributions to education have made him one of America's outstanding leaders. In addition to his interest in general educational theory he has held a major interest in geographic education, and is well known as coauthor of a series of elementary geography texts. Dr. McMurry is now endeavoring to solve some of the perplexing problems in the selection, organization, and presentation of geographical materials.

Geography and World Citizenship. By L. O. Packard 169

Mr. Packard is a professor in geography in the College of Education of the City of Boston, and was President of the National Council of Geography Teachers in 1928. He is probably best known to teachers as coauthor of "Nations as Neighbors."

An Interest-Stimulating Device 179

Editorial Notes and News 180

Geographical Publication 182

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THE IRON AND STEEL INDUSTRY OF THE UNITED STATES

RICHARD HARTSHORNE
University of Minnesota

THE GEOGRAPHIC SIGNIFICANCE OF THE STEEL INDUSTRY

The iron and steel industry is commonly and correctly considered to be of basic importance to manufacturing industry in general. This is obviously true in regard to the industries that use large amounts of iron and steel in their products, such as the tinplate, automobile or locomotive industries, to mention but a few. But all other modern industries require considerable amounts of iron and steel in their tools, machinery, and general equipment, and increasingly in their buildings. Finally the railroads, that are absolutely necessary in the development of modern industries, use enormous amounts of steel. Consequently, the most important regions of general manufacturing, both in the United States and in the world in general, have developed around or near the great steel centers.

In comparison with many other industries the steel industry is notably concentrated in a small number of districts.[1] (See Fig. 1.) Steel mills are somewhat less concentrated however, than blast furnaces, shown on the map. Hence the presence of the industry in any area gives that area a relative advantage of great importance.

Of special interest to the geographer is the fact that the location of this industry reflects clearly a geographic relationship to natural factors, with social factors exerting only a minor influence. This results from the fact that such vast amounts of materials are handled, largely by machinery, so that labor is reduced to a minimum, and, since the requirement is chiefly for unskilled workers who are readily brought from distant areas, is of little weight in influencing the location of the plants.

[1] For a full discussion of these factors see: Hartshorne, Richard: "Location Factors in the Iron and Steel Industry," *Economic Geography*, Vol. 4 (July, 1928), pp. 241-252.

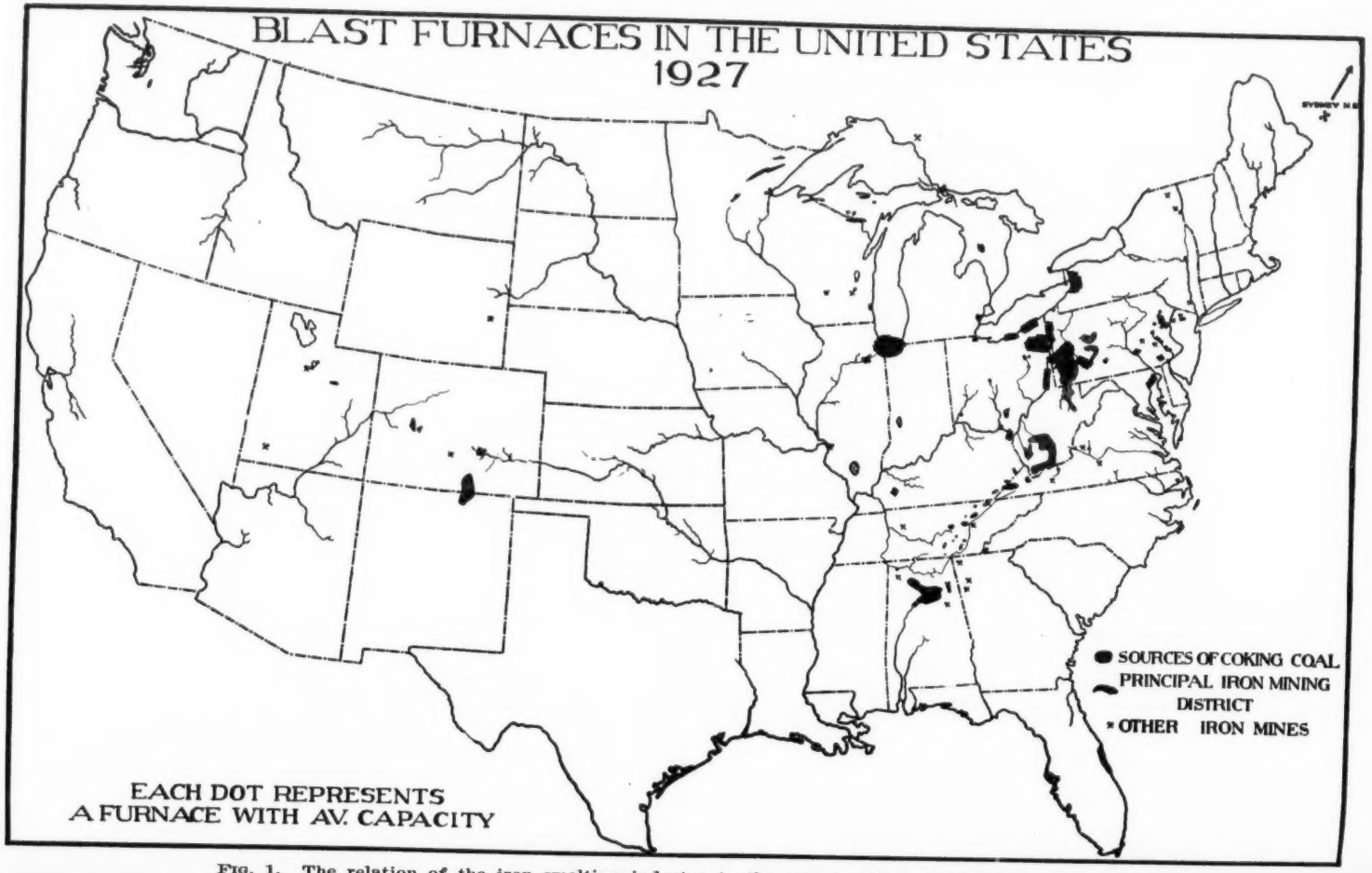

FIG. 1. The relation of the iron smelting industry to the sources of its principal raw materials.

To understand the reasons for the concentration of this industry in the regions to be discussed it is desirable to understand the principal steps in the conversion of iron ore into steel, and to know what materials and in what quantities are used in those processes. This is briefly summarized in the following paragraphs.[1]

MATERIALS AND PROCESSES OF STEEL PRODUCTION

Iron ore, with a small amount of scrap iron, is mixed with coke and limestone in a blast furnace in which the mixture is heated by the burning of the coke under a blast of air heated by the burning of by-product gas from the furnace itself. (See Fig. 5.) Vast amounts of water are also required for cooling the lining and other parts of the furnace. To produce 100 tons of pig iron requires 183 tons of iron ore, 3 tons of scrap, 46 tons of limestone, 102 tons of coke produced from 151 tons of coal.[2]

Most of the pig iron produced in the United States is converted into steel in the same plants, or in plants of the same company in the same district; the Alabama district, where a large part of the pig iron is shipped out, is a notable exception. Molten pig iron uncooled from the blast furnace, or imported pig iron reheated, is mixed with scrap iron and a small amount of ore, and converted into steel either in a Bessemer converter or an Open Hearth furnace. Small amounts of coal or coke are required to add the correct amount of carbon after the original carbon has been driven out of the iron. But large amounts of gas are required which is usually produced from coal, tho occasionally from oil, and, in the Pittsburgh district, is obtained from natural gas supplies. Relatively small amounts of lime and feromanganese, spiegeleisen, etc., are also used in different processes. To produce 100 tons of steel, steel plants in the United States use 90 tons of pig iron, with 18 tons of scrap and 4 tons of ore, and the fuel equivalent of 120 tons of coal (in the Calumet District, probably because of the more efficient use of coke-oven gas, only 82 tons of coal).

The steel ingots from the steel mill are then worked in rolling mills into forms for the market: rails, rods, bars, plates, wires, or nails. About 72 per cent of the steel produced in United States mills is shipped to the market in these forms as "finished steel" tho much of it is later used in further manufacture in "fabricating

[2] The figures given are averages for the whole country; each district or individual plant would show considerable variation from them.

FIG. 1. The relation of the iron smelting industry to the sources of its principal raw materials.

plants." The greater part is sent directly to the consumer, the railroads of the country taking nearly one-fourth the total steel production.

All the processes in the industry require a large amount of power, not only to operate the machines, but also to handle and transport the vast quantities of materials that are used. Some of this is generated by the by-product gas from the blast furnaces, the remainder chiefly from coal, tho in a few places from gas or water power.

Likewise required, is a certain amount of human labor, large in total, but small in comparison with the materials handled, most of it performed by unskilled workers, and finally a plant of very large size, tho not in proportion to production, and expensive to maintain, is required.

General Principles in the Geography of the Iron and Steel Industry

Of all the necessary elements in the steel industry, three are of major importance in influencing the location of its plants, all others being minor to them. These are the locus, or relative location, with reference to iron ore mines, coal mines, and consuming markets, respectively.

Iron ore is usually required in smaller amounts than coal in the steel industry and to that extent the ore factor is less important than the coal factor. The costs of handling and transportation are about the same, and there is less loss in handling ore. On the other hand, the iron mines of the United States are much more concentrated than are the coal mines and therefore give a more particular advantage to the mills near them than to those near coal-fields. Only the presence of the Great Lakes which brings a very wide area geographically close to the Lake Superior iron mines tends to obscure this fact. Putting these elements together, we can say that while the ore factor is a less powerful factor in influencing location of the steel industry, in the United States it actually exerts a greater influence than the coal factor. When low-grade ores are used, more ore than coal is required. At present the only important exception, therefore, in the United States is the Alabama district, where the difference is immaterial as the coal mines and iron mines are practically adjacent.

More important than either of the above factors, tho not as important as the two combined, is the "market factor," locus with

reference to the consuming markets. While the tonnage of steel produced is usually less than half of the iron ore and scrap used and less than half of the coal required for its production, the unit-cost of shipping, as expressed in freight rates, is commonly more than twice as much. The increasing amount of scrap iron used in making steel, in 1919, 18 per cent of the total, adds to the importance of the "market factor" as the chief sources of scrap are obviously coincident with the consuming areas.

Finally the "coal factor" is usually, tho not by any means always, combined with the "market factor" because the great importance of coal in industrial development of all kinds has led to the development of great markets for steel in most of the coal-producing areas. For this reason, it is usually true that "iron moves to coal," tho exceptions will be noted later.

The other elements of the industry are of minor effect in influencing the general location of plants. These include limestone, and other minor materials, which are used in small amounts.

Since limestone is used in much smaller amounts than the coal or iron, and is much more widely distributed, it exerts but a minor influence on the location of the industry. Even less important are the minerals used in mixing in making different kinds of steel, such as manganese and spiegeleisen.

Labor costs, however great in total, are small in comparison with the transportation costs of the raw materials, and since the labor is chiefly unskilled and therefore mobile, this factor is minor, at least within the United States.

Capital, likewise, is completely mobile for the steel industry anywhere in the United States and is not a significant factor. The fixed investments in buildings and equipment, however, may retard any shift in the industry that changing conditions might require. This is particularly true because of the extremely large investment required in a modern steel plant, with its blast furnaces, steel mill, rolling mills, coke-ovens, etc. Consequently, such changes come not gradually, as in most industries, but in great jumps such as that caused by the construction of the United States steel plant at Gary.

Certain factors, unimportant in general location of the industry, are very important in determining the particular sites for plants within a given district. The vast requirement of water for cooling purposes causes practically all blast furnaces in North America to be situated either along streams or on the shores of the Great

Lakes. (See Figs. 3 and 4.) The large amount of land necessary for the plants, and formerly for waste disposal, necessitates sites outside the built-up portions of cities and gives a preference to marsh lands and lake fronts where waste can be used to fill in. On the other hand, sites near towns and cities may be preferred by large plants because of the minor labor advantages.

AREAL DISTRIBUTION OF THE STEEL INDUSTRY IN THE UNITED STATES

The relative effect of these factors on the location of the industry is illustrated by the distribution of steel plants in North America. The map (Fig. 1) shows the distribution of blast furnaces, the basic phase of the steel industry. All blast furnace areas are areas of steel production, tho some other areas or districts without blast furnaces are important in the manufacture of steel, and some of the areas shown are relatively more important in steel production than in the production of pig iron, the blast furnace product.[3]

The map emphasizes the striking concentration of the industry, particularly its primary phase, the smelting of iron in the blast furnace. There are a few regions of production which include a number of more or less separated districts, such as the Middle Atlantic Seaboard Region, the Northern Appalachian Region and the Southern Appalachian or Alabama Region. Some districts, however, are widely separated and not included in any region, such as the Adirondack district in northern New York. Each district may have several centers, frequently strung along the banks of the same river, but some districts, like St. Louis, Duluth, Pueblo, etc., consist of but single centers, in some cases, single plants, in a few cases, of but a single furnace. In most cases, the industry is carried on by large corporations operating large plants including several blast furnaces at each plant, with several corporations located in the most important districts. Notable exceptions, however, are found, chiefly in the older part of the country where small single furnaces are found scattered in small places; for example, the Middle Appalachian furnaces in Virginia and Tennessee, where 25 furnaces in nearly as many towns have a combined capacity of but 9 average furnaces.

[3] The map does not include charcoal furnaces which produce special grades of pig iron by the use of charcoal, instead of coke. They constitute actually a very distinct and separate phase of the steel industry, of minor importance in amount. The charcoal furnaces are all small and scattered in small places, chiefly in northern Michigan and in the Middle Appalachians.

SOURCES OF IRON ORE

The most striking single factor, if not the most important, in the location of the steel industry of America today, is the Lake Superior iron mining region. (See Fig. 1.) In this limited area, chiefly from the three ranges in northern Minnesota and to a lesser extent from the ranges in northern Wisconsin and Michigan, is mined practically all the iron ore used, in the steel regions that lie west of the Allegheny Front, north of the Ohio River and east of the Mississippi, or in other words, in over 78 per cent of the blast furnace capacity of the country. In view of the long distance, in mileage, of this mining district from both the coal-fields and the population centers of the country, the location of the Great Lakes Waterway, serving as a connecting link, is of vital importance in the development of most of the districts using the Superior or "lake" ores.

The only other iron mining district of major importance in the United States is the Alabama district in the Southern Appalachians. All the ore of this district is smelted in blast furnaces within the district and constitutes practically their entire supply.

In a number of other places in the United States, iron is mined in much smaller amounts and smelted in local furnaces. Most important of these lesser mines is the Cornwall mine in southeastern Pennsylvania; others are found in the Adirondacks, and in northern New Jersey where ore of special qualities is obtained, in a number of small scattered places in the Middle Appalachians, at Mayville, Wisconsin, and in the Rocky Mountains from Wyoming to New Mexico.

Foreign ores have been imported in recent years in increasing amount, almost exclusively to the plants on the Atlantic Seaboard, chiefly in Eastern Pennsylvania and at Sparrows Point, Maryland. These ores, imported chiefly from Chile and Cuba, but also from Spain and Sweden, are used in seaboard furnaces, not because of any depletion of our own resources, but rather because of cheapness of ocean transportation for such a low-valued, easily handled commodity means that foreign iron-mines are geographically nearer the Atlantic seaboard than is the Lake Superior district.

SOURCES OF COKING COAL

If the Lake Superior iron mining region constitutes one of the major concrete factors in the steel industry of North America, a

factor of the same magnitude is the Appalachian Coal-Field of eastern United States which includes, almost thruout its extent, rich deposits of coking coal. (Fig. 1.) Ever since coke from bituminous coal was found to be superior to anthracite coal in blast furnace use, this field has been dominant in the steel industry of the country, supplying the coke to every steel center east of the Great Plains, that is, to nearly 99 per cent of the blast furnace capacity of the country. The great length of the field, however, extending from western Pennsylvania to Alabama, makes its product accessible to a larger part of the country, so that it is a less limiting factor in the industry than the Lake Superior iron district. The Northern Appalachian steel region secures its coke within that region, chiefly in Pennsylvania; likewise, the Southern Appalachian steel plants secure coking coal from nearby Alabama mines. Coking coal from the Middle Appalachian region is used locally to some extent in Tennessee and Virginia, but most of it is shipped to outside centers, notably the Lake Erie ports, the Calumet district, and the Atlantic seaboard districts, where it competes actively with coke or coal from the northern fields. Elsewhere in the United States coking coal is mined only in a few scattered districts in the Western States.[4] A special exception is found at Granite City, Illinois, near St. Louis, where Southern Illinois coal is being used for coking purposes. If this attempt to use lower grade coals, which has barely passed the experimental stage, should prove successful, it might lead to important changes in the location of the industry.

THE CONSUMING MARKETS

The consuming markets for steel are, of course, much more widespread than either the coal or iron mines, for ultimately every town, every mine, and every farm is a market for a greater or lesser amount of steel. In general, of course, the consumption of steel varies with the population, but there are other factors that affect the relationship. The railroads of the United States use at least one-fourth of the steel made in the country, chiefly for rails and in the manufacture of cars and locomotives. Large amounts of steel are used in buildings of the type of steel construction found chiefly in the large cities, and large amounts are required in industries of

[4] Small amounts of coal from Illinois and Indiana are mixed with Appalachian coal in the coke ovens in the Calumet district.

all kinds, not only in the finished products, but also for buildings, machinery, tracks, pipes, etc. Consequently, the steel market of the United States can be thought of as corresponding to the density of population, save that relatively larger amounts are used in the larger cities and industrial centers, and in the rural districts the requirements are limited in kind, chiefly to railway rails and wire for fences. Some of the steel districts of the country depend chiefly on their nearby markets and are limited by them. Most of the larger districts ship outside into other competitive markets and a few of them market overseas as well, but only to a minor extent.

Most of the steel plants secure their limestone for mixing from nearby quarries. The only source of more than local importance is the large deposit near Calcite on the northern shore of the southern peninsula of Michigan. Since limestone can be readily handled in the bulk freighters used on the lakes in shipping ore and coal, the location of the quarries close to the lake shore makes this deposit readily accessible to all the steel centers on or near the Lakes. Limestone has become one of the major commodities in Great Lake shipping. Of the other materials used in steel-making, many of them come from remote sources: such as manganese from Georgia in the Caucasus, but all of these, as pointed out before, are used in such small amounts as to have no affect on the question of location.

The particular situation in each of the major regions can now be noted in detail.

The Northern Appalachian Region

Most important of all in the steel industry of the United States is the Northern Appalachian region of western Pennsylvania and eastern Ohio, including also the peninsula of West Virginia near Wheeling. (See Fig. 3.) This region contains 43 per cent of the blast furnace capacity of the country and its center, Pittsburgh, has been the recognized capital of the modern American steel industry. (Table 1.) The mills in this region are located almost exclusively in the narrow valleys of the headwater streams of the Ohio River, including the upper reaches of the Ohio itself. This relation is due not only to the water requirements but also to the fact that in this rough hill country the transportation lines, of which both rail and water are important, are confined almost entirely to the stream valleys.

TABLE 1

RELATIVE IMPORTANCE OF THE PRINCIPAL IRON AND STEEL REGIONS OF THE UNITED STATES*

	Blast Furnace Capacity	*Iron Ore Consumed*	*Pig Iron Produced*	*Steel Produced*
Northern Appalachian Region	43	42	43	42
Lake Michigan Region	17	20	19	19
Lower Lake Ports	15	16	17	13
Atlantic Seaboard Region	10	6	8	11
Alabama Region	6	10	7	4
Other districts	9	6	6	11
Total per cent	100	100	100	100

* Compiled from American Iron and Steel Institute, Annual Statistical Report, 1926; and other sources. Some estimating is involved so that the figures are only approximate; hence no decimal digits are used.

The region, frequently called the Pittsburgh-Youngstown region, includes two main districts. The Pittsburgh district, consisting of plants located in the valleys of the Ohio, Monongahela, and Allegheny, in and near, i.e., within 40 miles of, their common center at Pittsburgh; and the Youngstown or "Valley" district consisting of plants in the valleys of the Shenango and Mahoning Rivers, near their junction, in both Pennsylvania and Ohio (all within 30 miles of Youngstown). The Pittsburgh district, the greatest in the country, includes the equivalent of 75 blast furnaces, the Youngstown district 57. Other important districts are those of Johnstown, Pennsylvania, and Steubenville and Wheeling in the Ohio Valley in Ohio and West Virginia.

In all these centers one great advantage, as is well-known, is the proximity to abundant supplies of coking coal mined within the region itself. Less well-known is the less important advantage in steel making secured by using natural gas produced in the area. In its location with respect to the markets, this region has in the past had an advantage over all others. Lying between the Middle West and the Atlantic Seaboard, it occupied a central position of the northeastern quarter of the United States, the most densely populated region of greatest industrial development and of greatest railroad construction. If one excludes the Pacific Coast and the scattered cities of the Rocky Mountains, the center of industrial gravity of the United States in the latter part of the nineteenth century must have been not far from Pittsburgh, and today is probably east of Columbus. This region, therefore, has always had

a great advantage over other regions in its location with reference to this great market area.

The chief disadvantage of the region, of course, is its remoteness from the source of all its iron ore, the Lake Superior district, a situation previously discussed. This handicap can not offset the two great advantages of the region.

Within the region there are minor differences in the situations at the different districts. The "Valley" or Youngstown district has the advantage of being nearer the Lake Erie ports thru which the iron ore moves. In the Pennsylvania districts, on the other hand, the mills are in most cases nearer to the coal mines, and are generally able to bring their coal by cheap water transportation on the rivers (particularly the Monongahela) directly from the mines. In some cases, as at Johnstown, the mines are so close that the coal is taken in the mine cars directly to the coke ovens adjacent to the steel plant. The Pittsburgh district enjoys special advantages over the others because the early commercial importance of the city at the Forks of the Ohio, and the early importance of that district in steel making, combined with the relief features of the region to make Pittsburgh the pre-eminent rail center of the entire area south of the Lakes.

THE LAKE ERIE PORTS

Closely related to the Northern Appalachian region are the steel centers at the Lower Lake ports, particularly those on Lake Erie. (Figs. 1 and 2, Table 1.) These represent a somewhat different adjustment to the same three major factors, namely the Lake Superior ore district, the Northern Appalachian coal, and the market region of Northeastern United States. Location at the Lake ports brings these steel plants somewhat closer to the source of iron ore and eliminates the rail haul from the lake freighters; on the other hand it places the plants farther from the coal mines. While there is probably no saving in ton-miles of transportation there is a considerable saving because an extra handling of the iron ore is eliminated by receiving the ore directly from the lake freighters onto the docks of the steel plants. On the other hand these centers are located more on the northern edge of the great market region of the country, rather than near its center; this however is probably off-set in part by the special transportation advantages offered by the many rail lines concentrated at lake ports,

as well as by the lake waterway itself, tho the latter is as yet but little used in shipping the finished products.

While steel plants are found at no less than six of the Lower Lake ports (Detroit, Toledo, Lorain, Cleveland, Erie, and Buffalo) they are notably concentrated at the two great cities near the eastern end of Lake Erie, Buffalo (including Lackawanna) and Cleveland. Buffalo while farther from the Interior markets than

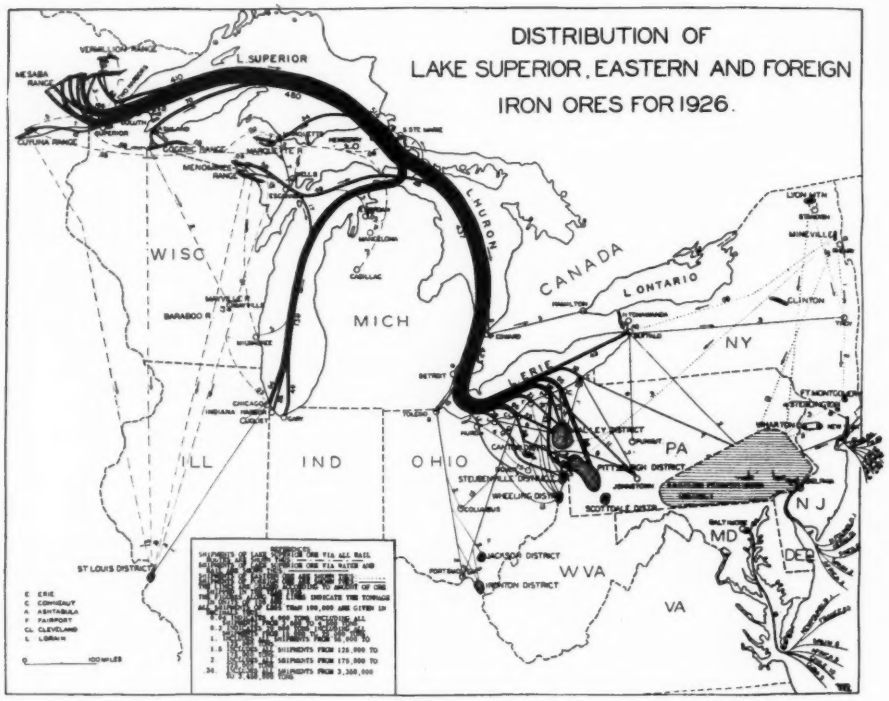

FIG. 2. The movement of iron ore in the United States east of the Mississippi and north of the Ohio.

the other ports is nearer the eastern markets and has exceptional advantages as the terminus of many eastern railroads as well as the Erie Canal. It ships a large part of its pig iron production, perhaps a fourth, to the Middle Atlantic Seaboard and New England. Cleveland is somewhat less important as a rail center but is nearer both the coal fields and the center of the market area. All of the ports are for practical purposes the same distance from the iron mines.

A somewhat similar but essentially different situation is found in the group of centers near the head of Lake Michigan. Aside

from the minor centers of Milwaukee and Joliet, this region consists of the increasingly important district built up on the outskirts of Chicago and known as the Chicago-Gary, or Calumet district. Within a fifteen-mile strip on the lake shore southeast of Chicago are included two, South Chicago, Illinois, and Gary, Indiana, of the fourth largest single steel centers in the country,[5] and a third center of no small importance, Indiana Harbor, Indiana. These three contiguous centers all have harbors developed largely or entirely artificially, for the benefit of the steel plants. The district as a whole is second in importance in the United States only to the Pittsburgh district, which it is probably destined ultimately to surpass. In no other district of this size in the world is there such a great development of the steel industry.

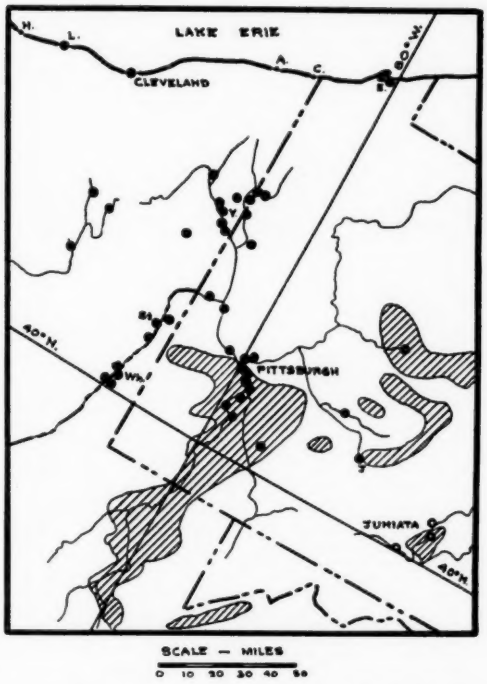

FIG. 3. The Northern Appalachian Iron and Steel Region. The map is arranged to illustrate the relation of the steel centers to the river valleys, the source of coking coal (shaded), and the Lake Erie ports thru which the iron ore is received, namely: Huron, Lorain, Cleveland, Ashtabula, Conneaut, and Erie. Important steel centers marked by letter only are Johnstown, Steubenville, Wheeling, Youngstown.

This district has the same advantage with reference to its ore supplies as the Lower Lake ports, but no greater; the distances from the ore shipping ports on Lake Superior are practically, and the actual rates of shipping, exactly, the same as to the Lake Erie ports. On the other hand in comparing the two districts with reference to the source of coking coal the Calumet district is at a disadvantage by as much as the cost of shipping by lake from the Lake Erie ports, since the cheapest means of bringing West Virginia coal to the district is the rail-and-lake route. The

[5] The other two are Youngstown and Buffalo. In the Pittsburgh District the plants are strung out at different places along the narrow river valleys, so that no one center is the equal of these.

great advantage, however, of the Calumet district, is its exceptionally advantageous location with respect to the growing market of the Northern Interior of the United States west of Ohio. Because of its central position within that region and because of the transportation advantages offered by the fact that its being a part of the one great railroad center of central North America—Chicago—this district has been able to offset the lesser disadvantage noted and, in spite of artificial handicap of "Pittsburgh plus," it became the one center to challenge effectively the dominance of Pittsburgh. Since the abandonment of that policy the plants in the Calumet district have been operating at much more nearly their capacity than have those in the Pittsburgh district; with the construction of new plants already planned for, the Calumet District should very shortly be first in production (tho the total production of the Northern Appalachian Region will still far surpass that of any other *region*).

DULUTH

In contrast with the great development of the steel industry at the Lake Erie ports and at the southern end of Lake Michigan, is the very small development at Duluth, at the western end of Lake Superior. And yet at no point in northern United States can the raw materials of the industry be assembled at a lower cost. This situation differs from that at the Lake Erie ports only in that the coal is brought up the lakes instead of the ore being shipped down, and Duluth profits from the lower back-haul rates. The great handicaps that retard the growth of the steel industry at Duluth are its remoteness from the great markets of eastern United States, and the small and limited market for steel products in its immediate hinterland—the forest, farm, and range region of sparse population between Lake Superior and the Rocky Mountains. The removal of the artificial control of the "Pittsburgh plus" policy has resulted in no material change in the relation of these factors and in no great change in the production in Duluth.

OLD APPALACHIAN FURNACES

All of these districts of the Northern Interior of the United States have been developed during the modern period of large scale exploitation of the great ore resource of the Upper Lakes district and the coking coals of the Northern and Middle Appalachian fields. East of the Allegheny Front—the "Great Divide,"

geographically speaking, between the Interior and the Atlantic Seaboard—the industry is much older and is based on other resources, particularly other resources of iron ore. In place of one great deposit of iron ore this area possesses many deposits, most of them small, scattered from New York to Alabama. On the edge of the Adirondacks, in the folded ridges of the "Newer Appalachians" and in the low hills of the Piedmont many small deposits, chiefly of low grade ore, have been found, and mined, and smelted by local interests. At many of these places furnaces were built in the charcoal period of iron smelting, some of them dating from colonial days. Some of these metamorphosed, first into anthracite furnaces and then into coke furnaces, a few still continue to produce charcoal iron, but the great majority have been abandoned, their ruins long since overgrown with brush or torn down, eliminated in the competition with the cheap large scale smelting of cheap high grade Lake ores in the Pittsburgh-Youngstown region.

In some places however special advantages have enabled the industry to continue on its former scale, and in a few to increase greatly and to develop new plants. For example at Wharton, New Jersey (Fig. 4), the use of new processes produces, at low cost, concentrated ore of sufficiently high grade to make smelting profitable. In the upper Juniata Valley in Pennsylvania (Fig. 3), in the Piedmont in Virginia and in the Great Valley of Tennessee (Fig. 1) the close proximity of coking coal a few miles to the west enables many of these small furnaces to continue in operation, at least part of the time. Some of these furnaces, notably those farther north, use Lake ores as well as local ores. A somewhat similar situation is found in one district, outside this region, in the middle Ohio Valley near Ironton, Ohio, and Ashland, Kentucky, where old, small furnaces established to smelt local ores are now charged with both local and Lake ores. (Figs. 1 and 2.)

While the small furnaces scattered thruout this region represent a declining remnant of an industry developed under conditions now changed, in two widely separated areas, in the Middle Atlantic Seaboard and in Alabama, iron and steel production has been developed on a modern scale and with modern equipment replacing the old furnaces and mills. In each case this modern development represents an adjustment to the factor of markets in relation to which each of these districts has notable advantages over other iron centers in the region.

THE MIDDLE ATLANTIC SEABOARD REGION

The iron industry of eastern Pennsylvania first assumed great importance in the early part of the nineteenth century when the use of anthracite instead of charcoal in the furnaces led to the concentration of the industry along the valleys of the Lehigh and Schuylkill rivers between the anthracite coal fields and the cities of Philadelphia and New York. (Fig. 4.) No region or district has since had competitive advantages equal to those of the Eastern Pennsylvania region at that time. When coke produced from bituminous coal proved to be a better and cheaper fuel than anthracite coal, and the ore deposits of the Lake Superior district were found to be superior and far greater in amount than the scattered deposits of Pennsylvania, and the center of pig iron production therefore shifted west, along with the shift in markets, to the Pittsburgh-Youngstown region, the older region retained certain more or less permanent advantages resulting from its early importance. These consisted not so much in the large investments in land and buildings, for new developments required new equipment, as in the established railroad connections and the markets for iron and steel in the other industries, bridge works and locomotive works, for example, which had been developed there in the period of its preeminence in iron production.

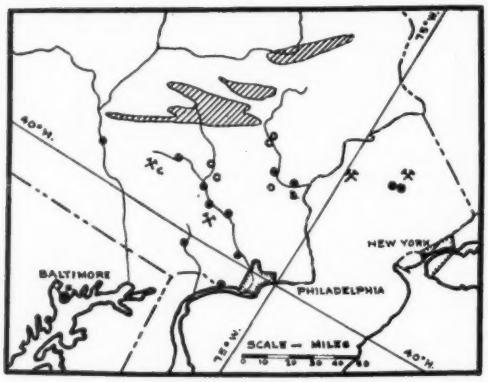

FIG. 4. The Atlantic Seaboard Iron and Steel Region. The map emphasizes the historic location of the present centers in the stream valleys leading from the anthracite coal fields (shaded) to the large cities, and their present locus in relation to local iron mines (crossed hammers) and to tidewater. Solid circles represent plants having large modern furnaces (most important are B, Bethlehem; S, Sparrows Point); hollow circles represent much smaller, almost antiquated furnaces. C, Cornwall iron mine.

This historic factor is however probably minor in importance.[6]

[6] Somewhat similar conditions did not avail to keep alive anything of the early smelting industry of New England. In some respects, in fact, the historic factor has worked disadvantages; certainly the location of the Bethlehem Steel plant 57 miles inland from tidewater is something of a disadvantage, tho not sufficient to justify moving the plant.

The Middle Atlantic Seaboard Region has advantages of location that are important under present-day conditions. Most imporant of course is its location near the center of the great manufacturing region of the Atlantic Seaboard, the region of densest population and of the most intense industrial development on the continent. In addition, the location of the region close to tidewater, at New York, Philadelphia and Baltimore, distinguishes it as the one steel region of the country having ready access to foreign markets, a factor of increasing importance in recent years with the increase in our export trade in manufactured products. The location at or near tidewater also enables the plants in this region to import foreign ores from any mining areas of the world close to the sea, notably those in Cuba and Chile. Such ores amount to about half the total ore consumed in the region, and include the entire ore supply of the one tidewater plant, the entirely new and modern plant at Sparrows Point, near Baltimore. (Fig. 5.) The remainder of the ore supply is obtained for the most part from local sources, almost all from the Cornwall mine, near Lebanon, Pennsylvania. This is not only the largest ore mine in Northeastern United States but the only important one in the country outside of the Superior district to be mined by open-pit methods. That the situation with regard to ore is not entirely advantageous, however, is indicated by the considerable movement—in 1926 about one-sixth the total consumption—of Lake Superior ore, in spite of the remoteness of its origin.

With reference to the sources of coking coal the region has not, of course, the advantages of the Northern Appalachian region, but is perhaps on a par with the Calumet district. Coal is brought from western Pennsylvania or West Virginia, either direct by rail, or, in a few cases, by rail and coastwise barge movement. (Fig. 5.)

The Middle Atlantic Seaboard Region is the only major region in which the production of pig iron and steel is notably greater, in proportion, than the iron ore consumed. (Table 1.) While a little over 6 per cent of the iron ore consumed in the country is smelted in this region most of it is high-grade ore, foreign or local, or concentrates of local ores, and so yields 8 per cent of the pig iron of the country. The steel production of the region is, however, even greater, nearly 11 per cent. Because of the relatively larger amounts of scrap available in this highly industrial

region nearly all of the mills use a larger proportion of scrap in the steel furnaces than do those of other major regions. Furthermore there are many steel mills in this region operating without blast furnaces, depending both on scrap and on pig iron shipped in from other areas, particularly the Buffalo district and the Northern Appalachian Region.

THE ALABAMA REGION

While there are a number of places in the Great Valley of Tennessee where workable deposits of both iron and coal, and limestone as well, are found within the range of a few miles the ores are all of low grade and most of the deposits are small. In the Southern Appalachians in northern Alabama, however, large deposits of these three raw materials of steel production are found in closer juxtaposition than at any other place in North America, if not the world. While the ore is of low grade, comparable with the Lorraine ores, and requires shaft mining, much of its rock content is lime so that it is in part self-fluxing. Because of the great savings in transportation costs, and also because of lower cost of living for the workers, it is claimed that pig iron can be produced in the Birmingham district at a lower cost than anywhere else in the United States.[7] Located where the Appalachian prong of coal and iron resources extends farthest into the South this district was much better situated than the other Appalachian districts to supply the markets in that part of eastern United States most remote from the great steel centers of the North. It was well nigh inevitable therefore that industrialization of the South should bring about the development of iron smelting and steel production in northern Alabama. On the other hand it is natural that the same factor which stimulated the development of the Birmingham district, continues to retard its greater growth. (Table 1.) The remoteness from the great steel markets of the North excludes the Birmingham district from competing there just as much as it excludes northern producers from the Southern market which is as yet so much less important. The effect of this handicap in a district so well supplied with raw materials is reflected in the large surplus production of pig iron, over 40 per cent of the total, shipped north to steel mills nearer the markets, particularly in cities of the Ohio Valley and the area between it and the Great

[7] *Economic Geography*, October, 1928, Vol. 4, p. 365.

FIG. 5. General view of the Maryland Steel Plant, Sparrows Point, Md., about 10 miles from Baltimore. Foreign ores are unloaded at the dock on the right; Appalachian coal is unloaded from coast-wise barges at the dock in the left foreground and carried by belt conveyor to the coke-ovens in the center foreground; behind these are the six blast furnaces; in the center are the steel furnaces, rolling mills, etc., with shipbuilding works on the extreme left. Courtesy of Bethlehem Steel Corporation.

Lakes. In the export trade the distance from the sea—276 miles to Mobile, 354 miles to New Orleans—in spite of the 20 per cent cut in rates afforded by the Warrior River service, has apparently prevented the Birmingham district from competing successfully with the Atlantic Seaboard Region.

STEEL PRODUCTION IN WESTERN UNITED STATES

Notably striking is the almost complete absence of blast furnaces west of the Mississippi. This is due, not to slowness of development in new regions, but to the absence of important markets, excepting on the Pacific coast, the lack of iron ore excepting in a few remote mountain districts, and the lack of coking coal thruout most of the region. An exception is made possible by an available iron deposit in eastern Wyoming, and the Trinidad coal field in Colorado and New Mexico but the resultant industry at Pueblo, Colorado, is necessarily limited to the relatively small markets of the intermontane region, the Pacific Coast being probably as near or nearer, geographically, to the Alabama or Middle Atlantic Seaboard regions.

Mills converting pig iron into steel, including those buying their pig iron, are more influenced in their location by locus in relation to markets, so that such plants are much more widely distributed in areas of industrial development than are blast furnaces, but the regions and districts of concentration are approximately the same.

THE FUTURE

Since the location of iron and steel industry depends primarily on the relative costs of handling the materials involved in the industry, concerning which we have considerable knowledge, predictions of the future can be made with somewhat more assurance than is true of most industries; even then ample allowance must be made for revolutionary possibilities resulting from new inventions.

It is clear that the near exhaustion of the high grade ores in the Lake Superior district, definitely expected within a generation, will notably change the relation of the basic factors in the situation in practically the entire country. One highly possible result would be the development of a great increase in smelting at Duluth, in order to ship the much smaller amount of pig iron east; but it is also possible that the higher costs of production would stimulate

the Atlantic seaboard industry, using foreign ores. On the other hand the successful development of ways of using lower grade coal for coke would stimulate production in the Mid-West, as at St. Louis. Increased markets in tributary areas should unquestionably result, whether gradually or relatively suddenly, in increased production of steel at Duluth and in Alabama; such an increase is presumably certain in the latter region. Increased exports of steel products would be to the advantage of the Eastern Pennsylvania region, notably plants located, now or later, at tidewater, and, perhaps to the Alabama region; the Lake centers particularly the Lake Erie ports might also compete in the export trade, especially if the St. Lawrence Deep Waterway were completed.

While the present trend unquestionably points to the gradual abandonment of most of the old, small, scattered furnaces thruout the Appalachian regions, it is quite possible that the decline of the high grade "lake" ores might result in renewed exploitation of the poorer ores in this area and a consequent renewal of the smelting industry either at the old centers or possibly at a few points of concentration determined by railroad routes and coastwise transportation.

THE SELECTION OF SUBJECT MATTER FOR GEOGRAPHY IN THE ELEMENTARY SCHOOL*

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THE PREVAILING UNIT OF SUBJECT MATTER IN THE PAST

"What shall be the prevailing kind of unit of subject matter," seems to be the leading question at present in the making of a geography curriculum. For generations the main unit has been the political division with a fixed list of topics under it. Both in the textbooks and printed courses of study the 13 countries of South America and the 20 odd countries of Europe have received attention in this way. Likewise the countries of Asia and of North America. We have broken away from that plan a little in studying Africa, altho Egypt has always been one topic there, and the Union of South Africa another. Australia has generally been only

* Presented at the New York meeting of the National Council of Geography Teachers, December 27, 1928.

one unit: but if it was treated as more than one, it has been divided into its political sub-divisions.

Now and then some one has rejected in part or in whole this general plan and advocated some other; for example a study of the world by industries—the wheat regions, the cattle regions, the sheep regions, the mining regions, the manufacturing regions, etc. One of our prominent textbooks some 25 years ago adopted the latter organization.

But the innovation met with a cold reception; and the small number of such heretics has only emphasized the fact that the political division is the orthodox unit in geography. What has made it orthodox has been the common conviction that the facts of geography are mainly used under the heading of the particular country to which they belong. For example the sum of certain activities such as the raising of sugar-beets and rye, the mining of coal and the manufacturing of certain articles in certain places, etc. constitute the country called Germany; and such activities should all be studied under that heading; and the same holds for every other country.

OBJECTIONS TO THIS PREVAILING UNIT

Certainly there is much truth in this assertion and I am not wanting fully to oppose it. But let me call attention first to the defects of such organization. The demand for the sum of the things that make the political unit has required the following topics:—

1. Location of the country, including its boundaries
2. Surface features, including plains, mountains and rivers
3. Climate including winds, temperature and rainfall
4. Products including agricultural products, lumber, fish, minerals and manufactures
5. Main routes of transportation and travel
6. Leading cities

This list of half a dozen large topics has become so well established that it is a formula for the study of any country. No doubt many teachers can repeat it in their sleep. From 60 to 100 political divisions are ordinarily studied in the elementary school. Call the number 80 on the average. In the lower grades children run thru this formula 80 times; then in the higher grades they go thru it again 80 times; 160 times in all!

But what are the real objections to it? There are several:—

(1) So little detail can be furnished to the younger children that there is too little meat to hide the bones of the skeleton. The study is not only difficult for them but uninteresting. On the other hand the interest of the older children is threatened because they have covered the same outline of subject matter already.

(2) A formula as an outline or guide under varying conditions is generally an object of suspicion. The difficulty is that it exerts a strong influence toward ignoring the individuality both of the subject—and also of the student. In short it *endangers all individuality.* No doubt that partly explains the fact that after a child has studied 30 to 40 different countries according to the same plan, he knows next to nothing about any one of them. They are all so much alike and yet so different that the impressions received cancel one another.

(3) But the third objection is the vital one. This method of studying a country centers the attention on the physical facts of the country rather than on the peoples' relation to those physical facts. A recent visit to Mexico made me particularly conscious of this defect. When I went there I already knew about the surface of the land; the names of the leading cities and their locations; the products of the country, etc. etc. In fact I had several times written those things out in detail for the use of school children. But when I arrived there it was a surprise to me to find *how the people were living.* What I was most interested in on that visit I had scarcely touched in my study of geography.

This criticism means that our present study of geography by political divisions under the list of topics given above is extremely *academic; informational* or *encyclopedic; and above all non-human.*

If geography should be *primarily* a study of man in relation to his physical environment, present geography is far from what it should be; it is mainly a study of physical environment without man.

Attempts to Remedy the Defects of the Political Unit

I am aware that this complaint is not new; for *during* the past years there have been several attempts to remedy this defect. Let me recall three of them.

(1) One is the abandonment of the two-cycle treatment of the

countries of the world. The New World is studied in grades IV and V; and the Old World in grades VI and VII. That plan has the negative merit of reducing the number of times the formula is applied from 160 to 80. That is an important contribution to the happiness of children. But it has serious defects. It places the intensive study of the United States at least one year earlier than most teachers would like to have it. Also, the children who drop out of school early may scarcely have heard of the Old World countries. And the point of view is still non-human.

(2) The demand that geography be functional marks a very different kind of attempt. There is a fine idea in the word functional; for it suggests that the activities of the people in relation to their environment be made the central theme. In order to realize this expectation the problem is made the unit of the subject matter; the problem that is of *human interest*. So in planning a course on South America we endeavor to list such questions on Argentina, Chile, Brazil, etc. as are vital to geography itself, to society in general and to young people in particular.

But up to the present time this seems to be too large an order. I had expected years ago that geographers would confer, and state these problems—or that the teachers themselves would hit upon them. But so far as I know little has been accomplished in this direction.

And there is a definite reason for the failure. The problems on Argentina, for example, are expected to include in their answers the facts ordinarily covered under the formula of location, surface features, climate etc., The minimum essentials require that. Under the pressure of this requirement the problem tends to do little more than afford a somewhat interesting approach to the old, old formula.

Here is a procedure that is typical of a number of recitations I have seen. *Teacher*: "Children what problem shall we take up for the study of Argentina?" After some discussion they settle on the question:— "Why do so many people migrate from Europe to Argentina?" *Teacher*: "What shall we need to know in order to answer this question?" *Children*: "We shall need to find out about the location of Argentina—the surface features—the climate, etc." Then their work is cut out for them for some days to come—and along the old lines. The problem was only a bait.

The problem idea is excellent. But until it escapes from the

dominance of this formula it will effect little reform in geography. The subject will remain almost as coldly logical and non-human as ever.

(3) The demand that geography be made one of the social studies is a third attempt at improvement. But a boy whom I heard of recently illustrates the objections to efforts of this kind thus far made. Altho he is in the 7th grade of a well known school that stands for the social studies, he thought that Lake Champlain was one of the Great Lakes. He had never heard of General Lee, and he didn't know whether our Revolution preceded or followed our Civil War.

These last two attempts at reform are a revolt against the prominence of the political unit in geography with its established list of topics. Both of them want to humanize the subject. And while I cannot see that they have accomplished much, the discontent that they manifest, is itself an important proof of progress. If it keeps up, something is bound to happen.

What about the near future? What should be our next move? The most crucial part of the curriculum is in grades IV and V. What improvements should be attempted there in particular?

PROPOSAL OF A DIFFERENT KIND OF UNIT OF SUBJECT MATTER

In reply let me propose a basis for selection of subject-matter; and consider to what extent it meets the demands now made on geography. If it promises an improvement, my brief outline could be gradually filled in later.

I. ARRANGEMENTS ABOUT LAND IN A VILLAGE IN INDIA

In the Punjab in northern India near the foot of the Himalaya Mountains and about 250 miles directly north of Delhi, the capital of India, is a village called Kabirpur. It contains 283 inhabitants in 61 families, which is from four to five persons per family.

Fifty-five of the heads of these families are farmers who must all make their living from 136 acres of land. They average therefore about 2½ acres each. The other men help in the village and farm work. They can't spread out any, because there are other villages bordering close on this one, this being one of the most densely populated parts of the world.

Twenty-four acres out of the 136 are barren land, because torrents of water from a neighboring range of hills wash across the

land in some places, cutting deep gullies and keeping small areas covered with sand and gravel. But in order that there shall be as much good land as possible the entire village occupies only about 1 acre near the center of the piece. There is not even a road leading into the village, because it would take up too much space. There are only foot paths and of course the houses for the 61 families are very small. Generally they are only single rooms in rows, each room 22 feet in length and 10½ feet in width.

Nor is each man's land all in one piece. If it were, some might have the poorest land while others had the best. So each man's portion is scattered about, usually in at least 3 or 4 patches. They average nearly three-quarters of an acre in size. But one man has 25 parcels, which are of course very small.

How can 136 acres of land be made to support 61 families, when the average size of a farm for one family in the United States is 148 acres?

The Soil and Climate in That Section

The soil, too, is only fairly fertile, for it contains too much sand. But fortunately there are two seasons for growing crops. The Tropic of Cancer crosses India a little north of Bombay, dividing the country into two nearly equal parts. And this village is only about 500 miles north of that line, which gives it about the latitude of Savannah, Georgia.

But it is even warmer than might be expected, because the mighty wall of the Himalaya Mountains shuts off much of the cold from the north. And the village land is only 1000 feet or so above the level of the sea. In summer the temperature often reaches 100 degrees in the shade, and it seldom falls below 40 degrees in winter.

The difficulty for the winter season is mainly with the winds. They blow steadily from the north, and since they come from over vast highlands, they bring little rain. Ordinarily only about 6 inches of rain falls from December to March.

Since wheat is so important for bread and grows in a fairly dry climate, that is their main winter crop. With it they often sow a grain called gram. They usually have about 70 acres in these two grains. Altogether they put only about 76 acres into crops for the winter.

During the summer, from June to September they have a lot

more rain, an average of nearly 25 inches. This is because the winds have changed in their direction, blowing from the southeast across the Bay of Bengal against the mountains. Then they put not less than 22 acres into fodder for their animals, a dozen acres into corn, 10 into fruit, and 4 into vegetables. During that season they cultivate about 60 acres.

But, the difficulty is that these rains are very irregular; usually there is either too much or too little rain. Only about once in a dozen years do they have a satisfactory amount.

Irrigation could help in the dry seasons, and water for wells can generally be found by digging down 15 or 16 feet. But it costs money to dig wells and water fields; so that only about 3 acres are irrigated.

Results of Such Farming

With so little land and so many men to work it, we might at least expect bumper crops. But they average only about 10 bushels of wheat per acre and 12½ bushels of corn. Of course that is partly due to the very sandy soil. But there are additional reasons. Their tools and farm implements are nearly all of their own make. There is a carpenter and a blacksmith in the village, who earn their living by making and mending such things. They entirely lack many of the most desirable implements. For instance they cut their grain with sickles and thresh it out by the tramping of their weak little oxen. Their fields are altogether too small for the use of our kinds of machinery; and the inhabitants are too ignorant for such use. Only 17 persons out of the 283 can read and some of those cannot write.

How, then, do these people manage to live? They don't manage it very well according to our standards. The average income per family is less than $75 per year, when everything is reduced to its money value. But they usually keep about 20 milk cows and they can sell some wheat tho not much. They also sell some fruit, especially mangoes. There is only one kind of manufacturing in the village—the weaving of cloth for turbans—but that is of little importance. Their most important import is cotton cloth.

They live only by doing without many of the things that we regard as necessities. For example, their houses are not only one-room; but they have no windows. Altho the temperature in winter often ranges between 40° and 50° and has been known to reach the freezing point, the only heat they have is for cooking

and the main fuel is dung. They not only have no sewage system, but they have no toilets or outhouses for their own use. They get their water from wells, but they have only two of these in the village; and the difficulties of easy supply are increased by the fact that owing to the caste system, some classes must draw their water entirely from one well and others from the other.

It is not surprising, therefore, that the women at 50 years of age and the men at 55 can no longer work, and become dependents. But comparatively few reach such old age. Their expectancy of life is about 22 years, while ours is about 57.

Kabirpur is below the average in prosperity among the villages of the Punjab, representing probably about one-fourth of them. Everywhere thruout the Punjab, however, which is a province in the Indus Valley nearly as large as Montana and has a population of 20,000,000 there is a real struggle for existence.

Other Types of Villages in India

A thousand miles south of the Punjab well within the tropics the villages differ from this one in important respects. On the Deccan plateau, between Bombay on the west and Madras on the east, grain sorghum and millet are the crops raised for food, and a large amount of cotton is grown to sell. India ranks next to the United States in the production of cotton. In the east of India in the Ganges Valley around Calcutta is a third kind of village, where rice is the chief food crop and jute is grown to sell.

There are seven hundred thousand villages in India, averaging about 400 inhabitants each, and containing in all 280,000,000 persons. In other words the population of India is mainly rural. In spite of its density it has only 3 cities with a population of more than one-half million. A brief comparison of these other types of villages with Kabirpur would give a rough insight into the prevailing life conditions of rural India.

Life in the Cities of India

After such study some curiosity arises about the cities of India. How are the people living there? And how many of them are any better off than these country people? What, then are the fabled riches of India that we have so long heard about? What are their exports as well as their imports? And by what routes are such goods carried? Thus the geography of India can be

primarily a study of the people as they are related to their physical environment; the people first of the rural districts and then those of the city.

II. Life in a Typical Village of Mexico

Turn next to the rural inhabitants of Mexico. An hour's walk or a short trolley ride takes one from the heart of Mexico City out to a village of perhaps 40 separate houses scattered over 2 to 3 acres and having 200 inhabitants. The ground is almost flat, and there are no trees in sight because the rainfall is too slight for vegetation. But in the distance can be seen the snow covered peaks of Orizaba and Popocatapetl, two of the highest mountains in Mexico, and many forest-covered mountain sides.

The houses are built almost entirely of adobe brick and are in small yards enclosed by adobe walls perhaps 3 feet high. Let us enter one of these enclosures. The little building to the right, 8 by 10 feet in size, is the kitchen. Inside this we find a 15 year old girl sitting flat on the floor with a bread board and rolling pin in her lap and a little fire close by her side in the very corner of the room. She is frying tortillas. She rolls one out at a time on the board, pats it to give it proper shape and then lays it on the metal plate over the fire. It is a very slow way of getting a meal—but what's the hurry?

There is no chimney in this kitchen, no window and only the one door. But the smoke finds its way out in time.

In another corner of this kitchen is a built-in stove. There is no furniture of any kind and the floor is dirt.

Stepping 15 or 20 feet over to the main building we find a living room possibly 15 by 20 feet in size. There are seven members in the family and they need so much space for here is where they all live. There is a door-way into a second room—but that space is for the storage of food, mainly corn and beans, and it has no windows.

On the walls of the living room are fastened many pictures cut out of newspapers and magazines. But there is no furniture except some straw mats that have been rolled up and stood in a corner. They are the beds for the seven persons, altogether too thin to protect the sleeper from the many bumps in the dirt floor. The room itself has no windows and only one outside door.

Stepping outside we see a pig in a small pen on one side of the

yard. We discover also a small space covered with thinly scattered horse-dung. That is not fertilizer, for this is early May and there is no sign of any gardens about the village. It is too dry for them and there is no arrangement for irrigation. In fact vast stretches of land about there are lying idle.

This horse-dung is their fuel, there are fully two pails of it in the yard, and that is what fries the tortillas. What about coal for the winter, or wood? Altho this village is well within the tropics, it is more than 7,000 feet above the level of the sea and that means that the temperature in winter is often uncomfortably cold. But Mexico produces almost no coal; and who would bring the wood from the mountains—and who would pay for it? So they don't use such fuels; and they get warm when warm days come.

These are the native Indians and half-breeds living almost in the shadow of the great city. They even make their living there as laborers. And the visitor, seeing what they don't have, suspects that this family of 7 could live easily on $100 per year.

Life in Other Mexican Villages

But if these people on the very edge of the capital city live so, how about the 11,000,000 Indians and mixed bloods out of the 15,000,000 inhabitants of Mexico, most of whom have never seen a city? Their living conditions are rather worse than better. For example, in the 1,000 mile climb by rail from Laredo on the Rio Grande boundary to Mexico City the traveler sees hundreds of worse looking homes. The walls of many of them are made out of old ties of the railroad placed upright, the chinks between being filled with mud. The gardens are few for most of the distance on account of lack of rain, and these people no doubt buy their food with their pay for work on the railroad. And even when one comes into the irrigated section, where corn and wheat flourish, one sees the grain cut with a sickle and threshed out by the tramping of animals, as in India. That signifies poverty.

Some 15 miles out from Toluca, the capital of the state of Mexico, there is a village in somewhat better condition. The land is well irrigated and one of the more intelligent men with 2 or 3 acres of corn for a front yard has 3 cots in his living room lifting the sleeper above the dirt floor, a bench and a couple of chairs. But his chief food is still corn and beans.

This village, however, is not as prosperous as it used to be. On its edge is a large cattle and wheat ranch which used to employ most of the village workers. But recently the government divided up 1,200 acres of the land among these villagers, leaving some 3,000 in the ranch. Now the ranch owner, not knowing what will happen next and having received no pay for his land, is doing little with it and therefore giving little employment to the villagers. Meanwhile these latter are making little use of the land given them largely because they are too ignorant and shiftless to farm independently.

Between Mexico City and Pueblo, a hundred miles away, is a village of some 300 inhabitants that turned out en-masse last May to welcome some government school officials. The federal government had established an elementary school there, and the people were showing their appreciation of such attention. The head man of the village was dressed in his best, which did not include shoes. The 70 odd toothbrushes hung on the wall of the school-room with a hair clipper above them showed some of the habits that the school was endeavoring to establish. But the garden was most revealing. It was, perhaps, a quarter of an acre in extent, well irrigated; and contained young cabbages, tomatoes, etc. The teachers were in charge of it and when the cabbages matured, a cabbage feast would be held, so that the villagers might acquire an appetite for something besides corn and beans. The federal normal schools are training selected Indians to raise these vegetables and then, as teachers, to introduce them to the people.

On the upper part of the steep slope from the great plateau of Mexico where one drops a mile and a half in traveling from Mexico City to Vera Cruz, is a coffee village, that is, the villagers work in the coffee plantations about there. But the government has confiscated a neighboring coffee ranch of 4,000 acres for the Indians and mestizos and taken 1,000 acres from the ranch on the edge of the village. The owner of the latter would like to introduce some new machinery, so as to roast his own coffee; but he is waiting to see what more the government will do. The villagers meanwhile are probably not so well off as before the land division. And that means that they are barely existing. Thruout this region of perpetual spring, where the rainfall is abundant and where all kinds of fruits and vegetables can be grown, the houses of the natives are still the one-room shacks.

City Life in Mexico

This village life, representing close to four-fifth of the population of Mexico, explains much about the cities. It explains first, why there are so few of them. There are only two containing more than 100,000 inhabitants. For cities exist in large part by virtue of what they receive from the country and what they send to it. And when the rural communities are producing little and consuming most of what they produce, cities are little needed.

When these villagers use the mud at hand to build their houses, have almost no furniture, eat little but corn and beans and wear the poorest of clothing, you can't expect to see much trucking. On the 50 mile drive from the federal district of Mexico City to Toluca, I did not happen to see a single truck. I saw only men, women and donkeys carrying burdens on their backs, and an occasional cart. In Toluca itself I doubt if there are 30 trucks, altho it is a state capital of 30,000 inhabitants.

Now we see why the magnificent view of Mexico City from the cathedral tower is not marred by factory chimneys and black smoke. In that area it is hard to count a dozen factory chimneys. Not only does the country lack coal; but the people have little present use for it, even if they had it. For where are the consumers for extensive manufacturing?

But Mexico City has a population of 600,000. What are they all doing? Are most of them living even as well as the rural inhabitants? What things are the Mexicans selling abroad and what are they importing? We are their principal neighbors. What things do we sell to them? And how can they pay for them? These are questions that naturally occur, after we have seen how the country people live.

III. A Village in New York

Come now to our own land. Not quite half of our inhabitants live in the country. Yet agriculture is still the basis of our prosperity. Village life here, however, has a different meaning, because the farmers usually live scattered about on the farms that they cultivate, rather than in a village in the narrow sense. And the village proper covers much more space, for we want plenty of room and air.

As an example take the village of Pawling, New York, 75 miles

north of New York City. The village proper contains 1100 inhabitants; and surrounding it are as many more people who make Pawling their center for trade. Let us take this village community of 2,500 persons as our unit for study.

Its Homes and Occupations

The village itself extends one and one-half miles north and south, about the same distance east and west, containing about 1,270 acres of land or 2 square miles. There are 203 dwelling houses, besides stores, etc., and the houses stand independent of one another with nearly one-half acre as the average size of yard for most of the homes. This does not include 8 farms which lie within the village limits and average 84 acres each. The houses are generally two-story frame buildings and having 6 to 8 rooms and windows on every side; and according to the tax assessors' books their average value including the yards is $6,352. Each family generally owns its home. Since the temperature ranges near zero several times each winter most of the houses have cellars with furnaces. And the entire community consumes about 4,000 tons of anthracite coal per year or 90 large carloads. At $15 per ton that costs $60,000 which is $24 per person. It consumes also about $10,000 worth of paint per year, or an average of $4 per person.

Each house in the village proper has running water, the water coming from springs 2 miles distant that are 250 feet in altitude above the central part of the town.

Altho the farmers' houses usually lack running water, they are not less attractive than the others and their yards are larger. Electric light, telephones and even radios are common both in the village proper and in the surrounding country homes.

There is a private boarding school for some 200 boys within the village limits. And there are many families from the nearby cities that have well equipped summer homes on the hills. In the summer also there are many summer camps for children from the city.

There are hardly less than 400 automobiles in the community, and four public garages accommodate them.

Among the stores are 3 large general stores, not less than 8 places where fruits, vegetables and other groceries can be purchased, 1 drug store, 1 large hardware store, 1 feed store, 1 lumber and coal yard.

Besides one commercial bank there is a savings bank that has 2,400 depositors, who averaged a deposit of $650 each in 1927. That means about one and one-half million dollars in savings. Evidently these people consume very extensively, and have the means for such consumption.

What about production? In the village proper there is only one large industry: 25,000 quarts of milk are bottled here daily, which comes from about 2,000 cows; and 25 persons are employed for the work.

But less than one-fourth of this milk comes from the Pawling district. The rest is brought in for bottling from more distant places.

Reasons for Changes in the Community

This community used to produce from 400 to 450 ten gallon cans of milk per day, while now it produces only 80, and the reasons for the reduction are interesting.

The surface of the land is reasonably favorable to grazing. It is very rough, to be sure, with hills or low mountains rising to an altitude of 1,250 feet above sea level. Possibly one-fourth of all the surface is wooded since it is not good for anything else. But the intervening valleys, from one-half mile to two miles in width, can be cultivated. The rainfall, also, is ample ranging around 40 inches.

Altho the section is only about 75 miles or 1° of latitude north of New York City, the valley land is some 600 feet higher than the city, and the temperature runs from 6° to 10° colder. That means only that the cattle must be well housed and well fed during a somewhat severe winter. It is not a great disadvantage.

But there are worse difficulties. The soil is so thin in places and there is so much outcropping rock in others, that many of the fields cannot be plowed. They are good only for grass and hay.

In many other fields the soil is poor compared with that in the central states. The fields, also, are so small, owing to irregularities of the surface and to the many stone walls, that much of the modern farm machinery cannot be used to advantage. The result is that these farmers cannot compete with those in Iowa in the production of the grain so necessary for cattle. Their main crop is hay. The general tendency is shown by one farmer who keeps 40 dairy cows and raised 4000 chickens last summer. Altho he and his son have 700 acres of land, they buy nearly all their

feed both for the cattle and the chickens—and they want to sell out. About one-half of the farm land and farm houses in this vicinity are idle and the farm population is less now than it was 50 years ago.

The section is in a transition stage from farming to the entertainment of city people. The wooded mountains, the little valleys and lakes with their many fine sites for homes and camps, and the attractive country roads are causing summer people to take up the land abandoned by the farmers.

Dependence of This Community on Others

But how dependent this country community is! Here are 2,500 people producing a little garden truck, a small amount of milk and meat and not much else. Yet they are consuming abundantly. They are getting their flour from the northwest, their meat from the west and Argentina; their cornflakes from Michigan, their sugar, coffee and bananas from the tropics; their materials for clothing from many distant parts of the world; their automobiles from Detroit; their gasoline from Mexico or Texas, their materials for paint from the south, and their lumber from the south and northwest. They are not producing one fortieth part of what they consume!

What a part transportation plays therefore in the life of this community! There is one railway thru the village with a large number of trains scheduled each way per day. And there is much long distance trucking. About 30 trucks are employed in the community itself, the lumber and coal company alone keeping 4.

Since most of these supplies come thru New York City, what a lot of trade and transfer of goods is caused there by this one little community! And how much is caused in far more distant places, since the average distance the Pawling supplies are transported is not less than 1,400 miles!

Other Village Types in United States

There are many other villages much like Pawling in the northeastern states. But they make only one type. How would a village in Iowa, in the midst of the corn belt compare with that at Pawling? Or one in a coal mining town in Pennsylvania? Or in a cotton manufacturing town in the South, or in the fruit section of California or in an irrigated section in the West? These different

types of communities are the "hinterland" of our cities, helping greatly to explain their importance by showing what is sent to them and what is received from them.

A Summary of Proposals Determining Subject-Matter for a Curriculum

In this article I have not been endeavoring to make a curriculum; but to suggest very briefly how a curriculum might be made.

1. Geography for the elementary school should be defined as the study of man in relation to his physical environment.

2. If that definition were accepted, it would rule out the present study of political divisions by the customary list of topics; because this list does not make man first either in time or in importance.

3. The general unit for study should be Community Life. And the two subdivisions of this unit might well be Village Community Life and City Community Life.

4. The Village Community should lead in time, because it is the simpler kind of study, contains most of the basal elements of home geography and furnishes motive for study of the cities.

5. The physical features, such as location, surface, climate etc., should be introduced only as they play their part in the lives of the people. By treating them as topics we divorce them from human beings.

6. Type treatment, by which one community is discussed in detail and then compared with others, affords the highest degree of concreteness in presentation. The customary generalizations in present geography make the subject needlessly abstract.

7. The minimum essentials of the curriculum should be the main facts showing how the village and city communities in the leading countries are related to their physical environment or are living. For example, the character of the homes, the extent and variety of their food, the amount of cartage on the streets; the relation of the temperature and rainfall to these conditions, etc., etc.

8. These guiding thoughts are applicable in principle alike to all grades. But I am stressing their application at present to grades IV and V, because they are suffering most.

9. One difference between the curriculum of grades IV and V as opposed to the higher grades should be far fewer countries treated—and in much more detail.

GEOGRAPHY AND WORLD CITIZENSHIP*

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INTRODUCTION

To be a good American citizen one must have knowledge of the people of other countries and must present a friendly attitude toward them and their affairs. The radio, the daily paper, the moving picture, and other means of conveying information bring knowledge of the activities of the most distant regions to all parts of our country. Even the remote rural districts have their world connections. They, too, have the radio, the rural delivery of the daily paper, and the automobile which takes the residents quickly to the town tho it may be many miles distant. Never was the demand for world news so great; never was such news so easily and cheaply obtained.

No place is too remote to receive our attention or too insignificant to arouse our interest in the problems of its people. Indeed, the problem of distant places are often closely related to our own. Our possession of the Philippine Islands gives us interests in Japan, in China, and in the Far East in general. American traders, investors, and scientists are active in every corner of the globe. The United States has assumed the guardianship of practically all of Latin America. The struggles and aspirations of the smaller nations arouse the interest and sympathy of many of our people. Distress in any part of the world brings quick response from all classes. So ready and profound an interest have we shown that many foreign nations have come to look to America for guidance and assistance in numerous ways.

Intimate knowledge of the people and conditions in distant lands leads to closer relationships and to sympathetic understanding. Mutual understanding fosters world peace and brings greater prosperity to all concerned. Clearly, it is the duty of all teachers to so present those subjects which in any way have to do with the relations of the individual and the community to other communities, whether large or small, whether near or at a distance, that the students will have broader sympathies and a wider knowl-

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edge, which will help to make them participants in a world-wide citizenship.

BROADER SYMPATHIES IN THE LOWER GRADES

The teaching of geography thruout its entire range in all the schools lends itself readily to the preparation of young people for world citizenship. Even in the lower grades imaginary journeys to distant lands, if properly taught, should lead the pupils to think of foreign peoples in a friendly way. Such journeys should develop an understanding not only of other peoples in their own lands, but also of the people of other countries who help to make up our own mixed population. Nothing will be more effective in making good citizens of our immigrants than the proper attitude toward them of the people of their adopted land.

Among our well-to-do classes journeys to distant lands are real, not imaginary. In some schools the teacher finds that many of her pupils, even in the grades, have traveled widely. Such children have the necessary background for the discussion of the characteristics of peoples, their contributions to world progress and their relations to other regions. Thru the study of the occupations of foreign lands children see that the needs in those countries are felt and met much as they are here at home. Thru the knowledge of such occupations understanding is gained of the independence of one region upon another for the necessities of life.

Even in the lower grades it is possible for pupils to appreciate in some degree the accomplishments of other peoples and to learn from their successes or their failures. They can understand, to a certain extent, the contributions each race or nation has made to world progress and world welfare. What might be termed a "homeland exhibit" makes distant people and products seem very real to the children of a school. Such an exhibit should be made up of articles contributed by the children themselves; each child, if possible, bringing in articles from his home which have come from some foreign country, preferably the country from which he or his parents have come or which some of his relatives or friends have visited. The value of such an exhibition can hardly be overestimated. Keen interest is aroused and much knowledge gained. Pupils can also understand that weaker or less progressive people must receive assistance from those who are more fortunate.

Aside from studies carried on in school, life in distant lands is made very real thru the world contacts of the home and the community. The daily paper, the radio, the moving picture, the welcome given to a visitor from some foreign country, the recognition of some daring adventure made by a foreigner, either abroad or at home, constantly compel the child to give attention to his close relationships to parts of the world outside his own country. Lindbergh's welcome in the various countries which he visited, and the reception given in this country to aviators from other lands serve as excellent examples of such contacts. Flights to the poles, whether accomplished by Americans, Scandinavians, or Italians, are considered of sufficient interest in this country to warrant the use of glaring headlines in all our daily papers. Fortunately the contacts are not limited to the city child. The same appeals reach even the remote parts of the country. Thus interest in world affairs is felt thruout the nation and a foundation is laid for increasing that interest and inculcating the importance of such relationships.

World Understanding in the Higher Grades

In the intermediate and higher grades the study of economic relationships between countries furnishes an excellent basis for teaching international cooperation. It is well to realize that peace and friendship are desirable not only as ends in themselves, but that they are an essential factor in all prosperity and progress. War results in a waste of the resources which are the foundation of industry and trade. It also makes it difficult, if not impossible, for a country to obtain the food necessary for its workers and the raw materials needed for its industries. At the same time markets are lost and routes of travel are endangered.

One of the greatest handicaps incident to the drawing of new boundaries in Europe is the unfriendly feeling of the people of neighboring countries. Agricultural Hungary is as favorably located to industrial Czechoslovakia and Austria as ever. All that is needed is cooperation to bring about an extensive exchange of products. The same might be said of the coal of the Ruhr Valley and the iron ore of Lorraine. Prosperity waits only for friendly relationships. Poland, lying between agricultural Russia and industrial Germany, needs more than anything else intelligent and friendly cooperation with the people of those countries. The mer-

chants of the United States in attempting to increase their trade with the countries of Latin America find that a friendly feeling on the part of the Latin Americans toward us is essential to success. Even in dealing with primitive peoples, as with the tribes of central Africa, it has been found that much more can be accomplished by persuasion than by force. The greatest mistakes made by the Germans in their efforts to develop the resources of their African colonies were their attempts to compel the natives to do their bidding. This policy only led to rebellion and partial extermination of the natives in a land whose prosperity depends upon native labor. It is necessary for our young people to realize that in order for trade to prosper there must exist a foundation of real friendliness between the trading peoples. It should be understood that the exchange of goods must bring real benefit to all the people concerned.

American international relations have been drawn much closer in recent years by the indebtedness of other countries to the United States. In all dealings with these debtor countries, whether economic or political, there must be considered the effect which any adjustment may have upon the ability of any of the debtor countries to meet its obligations. We must admit, therefore, a selfish interest on the part of the United States in the welfare of each of these countries. Such interest, of course, does not preclude a really friendly interest in the prosperity of a sister nation.

It is true that this very indebtedness has led to not a little bitterness in feeling toward the United States because of our decision to require full payment. The matter of indebtedness and the feeling regarding it should be understood as fully as possible by young people, for out of these feelings come acts by the United States and debtor countries which affect the trade and political relations of the nations involved.

Another factor which affects relationships between countries, and which young people should understand, is the investment made by the capitalists of one country in the resources of another. Such investments may lead to greater confidence and increased trade as illustrated by the holdings of the British and the Germans in some of the countries of South America. Argentine business men, for instance, feel more kindly toward British merchants because the British have shown sufficient faith in the people and the resources of Argentina to invest their capital and to establish banks

in the country. German capitalists with investments in Brazil or Chile are also much more likely to obtain from Germany the supplies necessary for their South American projects than from any other country.

On the other hand, if foreign participation in the development of a country is not undertaken with tact and discrimination, it may lead to suspicion and to very unfriendly relations. The investment of foreign capitalists in Mexico and China are good illustrations. In cases where the local government is weak, economic control by foreign capital is very likely to lead to loss of political freedom. Fearing such a condition as this, Japan has always taken great care to see that Japanese resources were developed under Japanese management. As a result of this policy Japan has retained its freedom and has come to be recognized as a world power and a formidable competitor in industry and trade. China, on the other hand, has been looked upon by progressive nations as a country whose resources might be exploited by those who could first obtain them.

Nations are also brought into closer relationships thru mutual problems which they must solve together. In the case of the United States and Canada, the international boundary, fishing rights, and the proposed deep waterways from the Lakes to the Atlantic are some of the questions which arise from time to time. Discussions between nations similar to these may lead to better understanding or to estrangement and even to war. The enforcement of the Monroe Doctrine brings the United States into diplomatic relations with the powers of Europe, with Japan, and with the countries of Latin America. A study of economic relations such as those just cited leads to the conclusion that economic, geographic, and political conditions affecting the relations between nations are often so closely interwoven that one cannot be considered without considering the others.

International organizations leading to the arbitration of disputed questions constitute one of the best means of drawing countries into closer friendly relationships. The Hague Conference, the League of Nations, the World Court, the various conferences and congresses for the discussion of specific problems all tend to bring about a better understanding.

I have tried to suggest some of the facts and principles regarding international relationships which the teacher of geography

and indeed of history and civics should bring to the attention and in so far as possible to the appreciation of the pupils in our elementary, junior high, and senior high schools. In teaching international relationships one of the teacher's aims, it seems to me, should be ultimate world peace. What hope, you may ask, have we of reaching such a goal? Perhaps for the near future the hope is small. On the other hand it is hardly conceivable that human beings will continue indefinitely to settle their international differences by the destruction of human life and the resources upon which the welfare and progress of the world depend.

OUR HOPES FOR THE FUTURE

In my opinion, hope for ultimate world understanding is based on four essential foundations: improved methods of communication and transportation; the necessity for greater economic interdependence; the ideals of peace and friendship inherent in all peoples; and the possibility of instilling in the minds of youth the necessity and desirability of world peace.

The importance of better communications and improved transportation facilities I have already mentioned. With nations as with individuals greater knowledge and better understanding of one another's points of view lead to the settlement of many difficulties. If the parties chiefly responsible for the overt acts leading to the Civil War, the World War or almost any other war could have sat about the same table and discussed the issues involved, it is more than likely that the wars would never have had a beginning. Misunderstandings occur because communication is carried on thru an exchange of notes, a method which makes it very easy for the parties concerned to make statements which they never would make if they were face to face and were thus made to feel immediately responsible for each statement. It would seem inevitable that the various agencies now established for the consideration of international problems could not fail to accomplish the amicable settlement of more and more of these perplexing questions. The encouraging results already shown by the work of the League of Nations are evidence of such a probability. The League offers the necessary opportunity for disputants to get together and present their grievances before disinterested judges.

The second hope for the growth of real friendship among nations is based on the high ideals of international good will common

to all people. During the World War the people of the United States rose as one person to help make the world free for democracy. Moved by a high ideal, they gladly sacrificed to assist the Belgians, the French and the other allies who they felt were being deprived of their just rights. So long as high ideals are presented to the people and so long as they feel that some are not taking advantage of their generosity to further selfish interests, so long will those who are high-minded continue to work and sacrifice for the good of others.

Good will manifested in contributions to the Red Cross and other organizations for the alleviation of human suffering is by no means limited to disasters within our own country. Subscriptions are made quite as readily to aid sufferers in Japan, China, Russia, or any other country. The Junior Red Cross which gives the young people in our schools opportunity to respond in a similar way is doing much to teach that human brotherhood is not limited by race or national boundaries. The exchange of toys, school work, and characteristic products as carried on by members of the Junior Red Cross is bound to arouse their interest, increase their knowledge, and give sympathetic understanding to the young students among whom this valuable work is carried on.

Officers in the armies in time of war have difficulty in preventing their men from fraternizing with the soldiers on the other side. Naturally, when the men become acquainted friendly feelings are engendered. If the soldiers are to be prepared to fight one another obviously they must not be permitted to become friends. There are many instances in which soldiers of one side have tried to relieve the suffering of their so-called enemies when opportunity permitted.

If we are willing to aid the people of distant regions when they are in trouble, why should not the same friendly feeling urge us to bring about such a fundamental basis of understanding and good will as will make it more difficult, if not impossible to go to war with them? Have we not sufficient evidence that the ideals of the people as a whole are so high that given the proper incentive in the form of a world organization, they will respond eagerly to the call for the realization of an international brotherhood?

If there is one thing more than another that should encourage people to follow their ideals, it is the realization that strife and warfare do not solve international problems. Indeed, it would

seem that by war problems are multiplied. There is laid in one war and in the so-called treaty of peace following it the basis for innumerable disputes, hatreds, and even other wars. The struggle between France and Germany for Alsace-Lorraine is a case in point. The many dissatisfactions growing out of the allocation of territory by the treaty of Versailles are others. Nearly all the decisions following wars are illustrations of the principle that might makes right. For this reason, there can be little hope of achieving a permanent peace by these methods. Why, then, are we not convinced that questions between nations should be settled in the same manner as questions between individuals, corporations, and the states of our Union?

Perhaps our greatest hope for world peace lies in youth itself. Youth has the great advantage of not being hampered by tradition and precedent. It is free to break with the past, to mark new courses, to build upon entirely new foundations. It is not embittered by past feuds nor by unsatisfactory settlements.

We often feel that the community and perhaps the world at large suffers a great loss with the passing of individuals who have given to the world great ideas or who have achieved great things. What a pity, we say, that all the accumulation of wisdom, of experience, of power should be lost. How much better if such human resources could be transmitted without loss to the next generation. But we must recall that it is not in this way that progress is made. The wisdom of the past and the experiences of the past are best suited to solve the problems of the past. They do not suffice to meet the problems of the present, much less of the future.

No doubt it is with this thought in mind that Soviet Russia forbids the teaching of history in its schools. Their leaders apparently are not interested in things as they have been or even in things as they are. They are concerned only with things as they think they should be. They fear that the knowledge and influences of the past will hamper or even prevent the establishment of the ideal state which they have thought out. Whether they can draw a hard and fast line between the past and the future remains to be seen. Be that as it may, they have in mind a fundamental principle: real progress depends upon youth freed as fully as possible from entanglements with things as they were.

I believe, however, that real and permanent progress takes place thru evolution rather than by means of revolution. Is it not because of this fundamental principle that war does not settle

disputes? I am firmly convinced that we have much to learn from the past. If the events of the past are properly interpreted they furnish many valuable lessons for our guidance. It is only when past experiences are too closely followed and relied upon that they serve as a hindrance rather than a help.

Age wishes to guide youth, to move forward with it, to give counsel from past experience. But nature forbids, youth must solve its own problems, must interpret the experience of the past for itself and be guided by its own conclusions. In meeting new situations youth must be free. Its vision must not be dimmed by the mists of past mistakes. The new problem requires a new perspective which is possessed by youth alone.

The necessity for the understanding of these principles is shown in the difficulties encountered by the peoples of Europe in maintaining order and peaceful relationships under the new regime when the minds of many of the leaders are keenly alive to all the old jealousies and rivalries which constantly menaced the peace of Europe before the World War.

Realizing, then, the part that youth must play in bringing about a new world order the duty of the teacher is apparent. The pupil must see the need, the desirability, and the great possibilities of world peace. No longer do individuals settle their differences by brute force. Corporations, states and frequently nations resort to courts and to boards of arbitration. And, as we have seen, war does not solve problems but rather multiplies them. Furthermore, preparation for war does not mean that peace will follow as is often claimed. It is more than likely to result in a race of preparation that finally leads to the outbreak of hostilities.

You may ask what all this has to do with geography and the social studies in general. It has much to do with them. The resources which serve as the basis of much of our study of geography are the causes of many disputes which lead to war. War brings about the destruction of these resources which would otherwise be used in promoting industry, trade and world peace. Peace leads to stability of world conditions, thus promising safety of investment at home and abroad. Peace makes it less necessary for a country to be economically independent and makes it possible for articles to be produced in regions best adapted to them.

If the study of geography is to do for the pupil all that it should, it must train him for the highest type of citizenship. Such citizenship means a regard for law and order not only in the com-

munity but in the world at large. Today when the reduction of time and space is bringing all parts of the world much nearer together, an individual, in order to be a good citizen of his community, his state and his country must recognize fully his obligations to the world as a whole.

AN INTEREST-STIMULATING DEVICE

We use from five to seven minutes at the beginning of each class period for drill. Here are two drills that have proved very satisfactory and illustrate the possibilities of the plan.

TRAVEL GAME

Teacher: I saw the capital of New York.—James
James: You saw Albany, New York.
James: I saw the automobile city.—Alice
Alice: You saw Detroit, Michigan.
Alice: I saw the rubber city.—Charles
Charles: You saw Akron, Ohio.
Charles: I saw some mountains in New York.—Robert
Robert: You saw the Catskills.

CLOCK GAME

A "clock" for each child is made by cutting out a round cardboard. A "hand" is made of cardboard. It is fastened onto the clock face by means of a paper fastener. On the face of the clock is placed the names of cities one wishes the children to know.
Teacher: My clock hand is turning to the largest city in Wisconsin.
(The children move their clock hands to the city.)
What does your clock say—John?
John: Milwaukee, Wisconsin
John: My clock hand tells me the capital of Wisconsin.—Elizabeth
Elizabeth: Madison, Wisconsin
Elizabeth: My clock tells me the furniture city of Michigan.—Mary
Mary: Grand Rapids

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EDITORIAL NOTES AND NEWS

Owing to the great advance in the efficiency of fuel-burning electric power plants since 1919, it has been very doubtful whether hydroelectric power would continue to compete successfully. It seems probable that the advantages of modern steam plants will retard the growth of hydroelectric plants in the near future, but restriction in their growth is not apparent in the records of the past year. The total installed capacity of water power plants in the United States January 1, 1929, was 13,571,530 h. p. This was an increase of 1,275,530 h. p. or 10.4 per cent during 1928. The gain during 1928 was more than twice the gain made during 1927. California with its 2,226,000 h. p., which is 16.4 per cent of the total developed in the United States, leads the list of states. New York with its 1,813,000 or 13.3 per cent of the total ranks second. It is interesting to note that these two states have approximately 30 per cent of the total developed water power of the United States.

The 1928 shipping season at Quebec was the greatest on record. A total of 225 vessels had their cargo surveyed, as compared with 154 in 1927. It is expected that 1929's total will be even greater, due to the operation of the new 2,800,000 bushel grain elevator.

An International Congress of Oceanography, Marine Hydrography and Continental Hydrology will be held in Seville, May 1-6, 1929. The principal object of the Congress is to initiate a series of meetings in which countries with maritime interests may discuss the various problems connected with the study of the vast oceanic regions, with the hope that by so doing a standard for such studies may be established. The work of the various national commissions now at work may thus be unified. An excursion through Andalusia and the north of Morocco is being planned.

From time to time, *Journal* readers have had their attention called to numerous publications of the Department of Commerce, such as the Commerce Yearbook, Statistical Abstracts, Special Agents Series, Trade Information Bulletins, Trade Promotion Series, Domestic Commerce Series, Miscellaneous Series, and the weekly issue of Commerce Reports. All of these may be obtained at nominal costs from the Government Printing Office. In addition, there are services of the department for which no charge is made. Some of these are in the form of mimeographed circulars covering various current commercial reports. A few of the most helpful ones are "Foodstuffs 'Round the World," especially those dealing with the grains, fresh fruits, meats, and dairy products; Foreign Highway News; Automotive World News; and various mineral and chemical divisions. In order to ascertain whether or not these circulars are of interest to you, send for sample copies from the Bureau of Foreign and Domestic Commerce, Washington, D.C., or from one of its district offices nearest your address.

Coal plays the all-important rôle of supplying 75 per cent of the world's power. Petroleum furnishes 19 per cent and water power makes up the balance. This evaluation of the world's power resources is made by W. O. Blanchard in an article, "Europe and the Power Map," in *Scientific Monthly*, Jan., 1929. The outstanding feature of the power map is the dominant power position of the coal producing countries: Great Britain, Germany, France. Another interesting feature is the statement that the coal and lignite output of the Netherlands approximates the much talked of water power development of Switzerland. Evidently, the "age of white coal" and the "age of oil" is not with us yet. In Europe as in the world as a whole, it is largely coal which motivates industry.

A sum of $60,000 will be used experimentally this spring with a view to hastening the break up of the ice in the St. Lawrence below Montreal.

The Illinois State Geological Survey announces the publication of Bulletin 56, "Illinois Coal: A Nontechnical Account of its Occurrence, Production and Preparation." It consists of 110 pages with 50 illustrations. The cost is 25 cents. It may be obtained from M. M. Leighton, Chief, State Geological Survey, Urbana, Ill.

According to a release of the Department of the Interior, February 12, 1929, water power was used to produce about 40 per cent of the electricity generated by the public utility power plants in the United States. Of the remaining 60 per cent, coal produced 88 per cent, gas, 7 per cent, oil, 4 per cent, and wood, less than 1 per cent. Increased efficiency in the utilization of fuels in the generation of electricity continues to be noted. In 1919, the average rate of coal consumption in generating electricity was 3.2 lbs. per kilowatt hour. The rate in 1928 was 1.76 lbs. The increase in efficiency in 1928 over 1927 amounted to a saving of about $8,000,000. A final report giving the total output of each state for 1928 will be published some time in April.

The Post Office Department announces that within the next six months the longest air mail route in the world will be in operation. This line will extend from Cristobal, Canal Zone, to Santiago, Chile, a distance of 3,400 miles. A triweekly service is proposed.

GEOGRAPHICAL PUBLICATIONS

Isaiah Bowman. **The New World. Problems in Political Geography.** (Fourth Edition) 803 pp., 257 maps including 2 series in color. World Book Co., Yonkers-on-Hudson, N.Y. 1928. $4.80

This edition of The New World is in reality an entirely new book, written in the light of the many great changes that have occurred since the first edition appeared in 1921. The reader cannot fail to be impressed with the tremendous amount of labor involved in bringing together, selecting, and organizing the huge quantity of material, and the keen and scholarly manner in which this material has been simplified and interpreted. No important element significant in human relations has been neglected. Each factor—economic, territorial, racial, historical, religious, political—has been analyzed carefully and evaluated. The volume might well have been titled—"The Problems of Nations," for it presents the crucial facts bearing upon perplexing national and international questions, and which must be considered if anything approximating an enduring solution is found. In most international ructions, whether they be in Latin America or Afghanistan, the basic causes are likely to lie in the domain of political geography. The New World presents the incontrovertible facts upon which such ructions occur, points clearly to troubles ahead, and to sound principles for the building of better international understanding. Its mastery by many so-called "statesmen" would aid in lessening much of the world's grief by producing more intelligently prepared agreements. Dr. Bowman is to be congratulated upon giving to the world such a constructive piece of work—a real contribution to geographic, national, and international thinking. His work is not only without a peer but is without a competitor. It stands alone on its intrinsic merit. No teacher, no student, no statesman should attempt to discuss international problems without having made its intimate acquaintance. G. J. M.

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Here are some of the things scheduled to appear in the *Journal.*

1. Modern Canyon Dwellers in Arizona. J. W. Hoover, State Teachers College, Tempe, Arizona.
2. Food Products from Latin America. E. H. Bailey, University of Kansas.
3. Qualifications Requisite for Teaching Geography. Zoe A. Thralls, University of Pittsburgh.
4. Industrial Geography. H. W. Fairbanks, Glendale, California
5. What Should a Geography Textbook Contain? Jessie Duboc, State Normal College, Dillon, Montana
6. Some Frontier Conditions in the Hilly Portions of the Ozarks. W. A. Browne, Teachers College, Nacogdoches, Texas
7. The Agricultural Industries. O. E. Baker, Senior Agricultural Economist, U. S. Department of Agriculture.
8. The Commerce of the United States. Helen M. Strong, Geographer, U. S. Bureau of Foreign and Domestic Commerce
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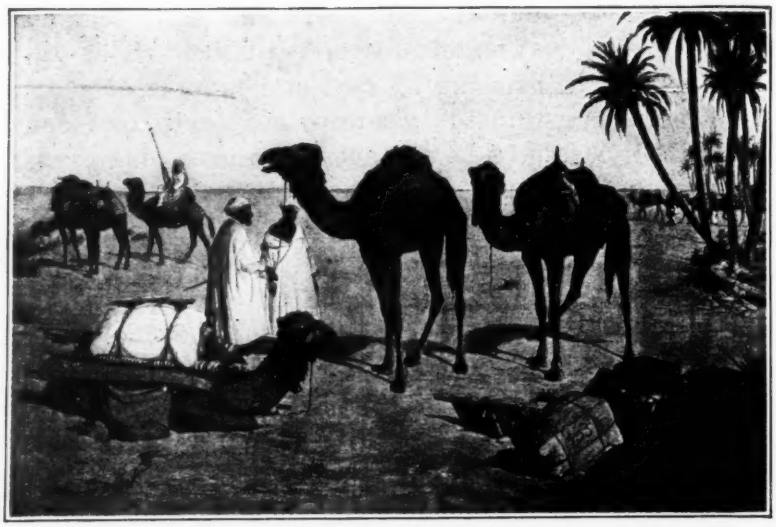

Schmeil Picture SZ10—Dromedaries at the Edge of the Desert, Morocco

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